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(58) Field of search
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(54) **Electrical contact alloy**

(57) An alloy comprising 30 to 60% by weight of palladium, 30 to 60% by weight of cobalt and 8 to 25% by weight of copper. The proportions are preferably within the range 40 to 50% by weight of palladium, 30 to 50% by weight of cobalt and 10 to 20% by weight of copper, and the preferred alloy comprises 40% by weight of palladium, 50% by weight of cobalt and 10% by weight of copper.

These alloys find particular use as electrical contacts particularly sliding contacts.

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SPECIFICATION

Improvements in or relating to alloys of palladium, cobalt and copper, particularly for electrical contacts

- 5 The present invention relates to alloys of palladium, cobalt and copper particularly as a material for electrical contacts, and more particularly for sliding contacts. 5
- The use of palladium-copper alloys containing 10 to 15% copper for electrical contacts is known from German patent specification no. 947742. With these alloys wear does occur when 10 the stresses applied are fairly high even though it is slight and uniform. 10
- U.S. Patent specification no. 2070272 discloses a switch contact made from an alloy comprising 60 to 85% palladium or platinum, 10 to 35% silver or copper, and 0.5 to 5% nickel, cobalt or iron.
- 15 It is an object of the invention to provide an alloy of palladium, copper and cobalt of this kind particularly for use as a material for electrical contacts, which alloy has very good strength characteristics and can be subjected to serve mechanical stress. 15
- Accordingly, the invention consists in an alloy comprising 30 to 60% by weight of palladium, 30 to 60% by weight of cobalt and 8 to 25% by weight of copper.
- 20 The invention also consists in an electrical contact, particularly a sliding contact, whenever made from an alloy as specified above. In addition to the electrical characteristics required for use in the field of electrical contacts and in addition to high corrosion resistance, the alloy according to the invention also has very good mechanical strength properties and can therefore be used with particular advantage for sliding contacts for transmitting low voltages and low currents. 20
- 25 It has been found particularly satisfactory to use an alloy comprising 40 to 50% by weight of palladium, 30 to 50% by weight of cobalt and 10 to 20% by weight of copper. A highly advantageous alloy whose composition falls within this range is that comprising 40% by weight of palladium, 50% by weight of cobalt and 10% by weight of copper. 25
- 30 Alloys according to the invention can be produced by the known technique of melting together the metallic components palladium, cobalt and copper in the quantities appropriate to the composition of the finished alloy. Because of its excellent ductility, alloys according to the invention are easy to work, for example by rolling or drawing. 30
- 35 The following table gives the density, tensile strength, yield point, hardness and resistivity of four alloys according to the invention, together with the corresponding values for known palladium-copper and palladium-cobalt-copper alloys for comparison purposes. The alloys according to the invention are distinguished from the known alloys by higher values for strength, hardness and yield point. 35

Table

Alloy	Density [g/cm ³]	Tensile strength [N/mm ²]		Yield point [N/mm ²]		Elongation [%]		Hardness HV1 [kp/mm ²]		Resistivity [mm ² /m]	
		formed	soft	formed	soft	formed	soft	formed	soft	formed	soft
Pd40Co50Cu10	9,96	1445	805	1415	550	1	50	445	255	0.23	0.21
Pd50Co30Cu20	10,24	1270	680	1240	375	1	31	410	195	0.36	0.34
Pd50Co40Cu10	10,23	1345	720	1300	385	2	35	430	195	0.26	0.24
Pd60Co30Cu10	10,54	1195	625	1170	265	1	34	405	160	0.31	0.29
Pd85 Cu15	11,42	810	375	800	165	1	42	255	105	0.40	0.40
Pd60 Cu40	10,57	870	450	870	175	1	41	310	120	0.35	0.36
Pd84Co6Cu10	11,38	855	430	815	170	1	36	265	115	0.51	0.51
Pd75CoCu20	11,06	915	500	885	205	1	38	300	135	0.59	0.60

CLAIMS

1. An alloy comprising 30 to 60% by weight of palladium, 30 to 60% by weight of cobalt and 8 to 25% by weight of copper.
2. An alloy as claimed in claim 1, comprising 40 to 50% by weight of palladium, 30 to 50% by weight of cobalt and 10 to 20% by weight of copper.
3. An alloy as claimed in claim 1 or 2, comprising 40% by weight of palladium, 50% by weight of cobalt and 10% by weight of copper.
4. An electrical contacts whenever made from an alloy as claimed in claim 1, 2 or 3.
5. An electrical sliding contacts whenever made from an alloy as claimed in claim 1, 2 or 3.

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